Examination of the Rare Labial Talon Cusp on Human Anterior Teeth

C. Lee,* S. E. Burnett, and C. G. Turner II
Department of Anthropology, Arizona State University, Tempe, Arizona 85287-2402

ABSTRACT The labial talon cusp, a triangular ridge of enamel near the midline of anterior teeth, has been observed in archaeological remains and modern dental patients. The purpose of our report is to describe new cases in order to provide better estimates of its frequency, symmetry, teeth involved, and geographic occurrence. This research was initiated after a labial talon cusp was found in a Caddo cranium curated in the Texas Archaeological Research Lab at the University of Texas at Austin. Subsequently, we identified additional examples resulting in the total of eight new cases presented here. Five cases were identified in the Native American Pima dental casts from the A. A. Dahlberg collection at Arizona State University. Two of the Pima cases were found in a systematic analysis of 1,835 dental casts for a population frequency of 0.11%. Additional cases were identified in Ainu and Anasazi skeletal material. Including these new finds, 15 cases of labial talon cusp are now known including Native Americans, African Americans, Japanese, Australians, and Europeans. Six cases are maxillary and nine are mandibular. Known maxillary cases are unilateral, while 55.6% of the mandibular cases are bilateral. All anterior teeth appear to be affected, but there is no recorded instance of an affected mandibular canine. *Dental Anthropology* 2003;16(3):81-83.

Recently, several authors have reported on the presence of a cusp-like structure on the labial aspect of anterior human teeth (Abbott, 1998; Jowharji et al., 1992; McNamara, 1997; McNamara et al., 1997; Schulze, 1987; Tomonori and Ogouchi, 1991; Turner, 1998). This feature is described as a triangular ridge of enamel, or a style near the midline of the tooth, located on the labial surface. The apex of this accessory structure terminates near the occlusal edge. Radiographs have shown this style to be made up of enamel and dentine, with sporadic pulp involvement (Abbott, 1998; Jowharji et al., 1992; McNamara, 1997; Tomonori and Ogouchi, 1991). Previous studies have referred to this feature as a facial talon cusp, labial talon cusp, and, simply, talon cusp (Abbott, 1998; Jowharji et al., 1992; McNamara, 1997). Since the *talon cusp* is more frequently used to refer to an accessory structure on the lingual aspect of the upper teeth, we suggest the use of the term "labial talon cusp."

Seven cases of labial talon cusp have been previously reported in the literature. Three cases were modern European; mandibular central incisors were affected in two individuals and a maxillary canine was affected in the remaining individual (McNamara, 1997; McNamara et al., 1997; Schulze, 1987). One case was a modern Japanese with a mandibular central incisor involved (Tomonori and Ogouchi, 1991). A labial talon cusp on the maxillary central incisor has been identified in a modern African American (Jowharji et al., 1992). Abbott (1998) found a modern Australian case with an affected maxillary central incisor. Lastly, Turner (1998) reported a labial talon cusp found on the maxillary lateral incisor from an archaeological Native American Anasazi.

RESEARCH AND RESULTS

New Cases

Eight new cases of labial talon cusp have been recorded by the authors. Bilateral labial talon cusps were identified archaeologically in the mandibular central incisors of an Ainu (Japan) (Fig. l) and a Caddo (Texas) (Fig. 2). Five cases affecting the mandibular central incisors were found among dental casts of living Native American Pima; three were bilateral (Fig. 3) and two unilateral. One unilateral case had the left central incisor rotated 180°, with the labial talon cusp facing the inside of the mouth. One archaeological Native American Anasazi was found to have a labial talon cusp on a maxillary incisiform supernumerary tooth situated between the central incisors, a mesiodens (Fig. 4).

There are few data on the frequency of this rare anomaly. Our original specimen was encountered during an analysis of 132 Native American Caddoan crania, from the collections at the Texas Archaeological Research Laboratory, University of Texas at Austin. All permanent teeth were examined. This yielded a labial talon cusp frequency of 0.76% for the Caddo. To determine the frequency of labial talon cusps in a large sample of Native Americans we subsequently examined a series of 835 female and 1,000 male dental casts from the Arizona State University A. A. Dahlberg Native American Pima dental casts. This analysis, limited to the mandibular and maxillary permanent incisors,

*Correspondence to: Ms. Christine Lee, Department of Anthropology, Arizona State University, Tempe, AZ 85287-2402. E-mail: Christine.Lee@asu.edu

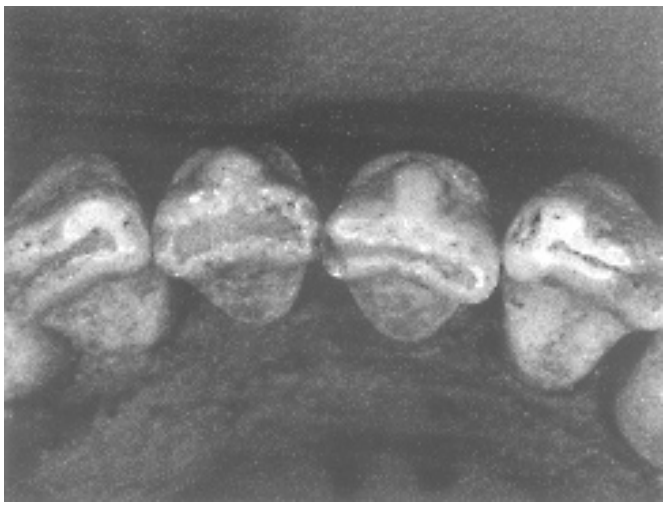

Fig. 1. Japanese (Ainu). Bilateral expression on mandibular central incisors.

Fig. 2. Native American (Caddo). Bilateral expression on mandibular central incisors.

yielded two cases for a population frequency of 0.11%. These data indicate the labial talon cusp is a rare trait with a population frequency of less than 1%.

Casts of the relatives of all five Pima individuals were examined since no familial case is known to date. Three parents and 19 siblings were examined but no additional labial talon cusp occurred. There is no evidence to suggest the five affected Pima were closely related to each other.

SUMMARY OF PRESENTLY KNOWN CASES

At the present time, a total of 15 individuals have been observed with at least one labial talon cusp (Table 1). All cases were found in the permanent dentition. Six cases of labial talon cusp were found on the maxillary teeth; all were female and unilateral. Three cases involved a maxillary central incisor while one case appeared on a lateral incisor. Labial talon cusps were also identified on a maxillary canine and an incisiform supernumerary tooth. There is some uncertainty if the supernumerary tooth exhibits a true talon cusp or some other abnormal morphology.

Nine cases of labial talon cusp involved the mandibular central incisors alone. Eight individuals of the nine were of known sex—two female and six male. Expression on the mandibular central incisor was bilateral in five out of nine cases (55.6%). Although only 15 cases are known, females appear to express the trait more often in the maxillary teeth, while males account for most cases in the mandibular teeth. There are no cases involving maxillary and mandibular teeth in the same individual. One known case exhibits a labial and a lingual talon cusp on the same tooth (Abbott, 1998).

TABLE 1. Known Cases of labial talon cusp

Group	Sex	Teeth	Source
1. Japanese	F	Max. left I1	Tomonori *et al*., 1991
2. African American	F	Max. right I1	Jowharji *et al*., 1992
3. Irish	F	Max. right C	McNamara *et al*., 1997
4. Australian	F	Max. left I1	Abbott, 1998
5. Native American (Anasazi)	F	Max. left 12	Turner, 1998
6. Native American (Anasazi)	F	Max. supernumary I	This study
7. German	?	Mand. right I1	Schulze, 1987
8. Irish	M	Mand. left I1	McNamara, 1997
9. Native American (Pima)	F	Mand. left I1, right I1	This study
10. Native American (Pima)	F	Mand. left I1	This study
11. Native American (Pima)	M	Mand. left I1, right Il	This study
12. Native American (Pima)	M	Mand. left I1 and right I1	This study
13. Native American (Pima)	M	Mand. left I1	This study
14. Native American (Caddo)	M	Mand. left I1 and right I1	This study
15. Japanese (Ainu)	M	Mand. left I1 and right I1	This study

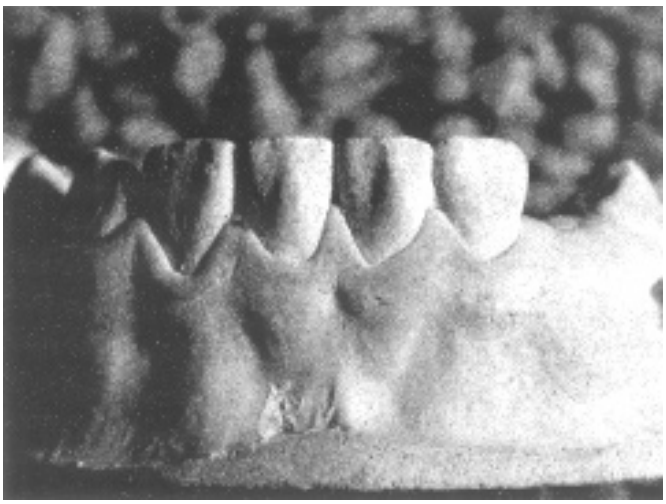

Fig. 3. Native American (Pima). Bilateral expression on mandibular central incisors.

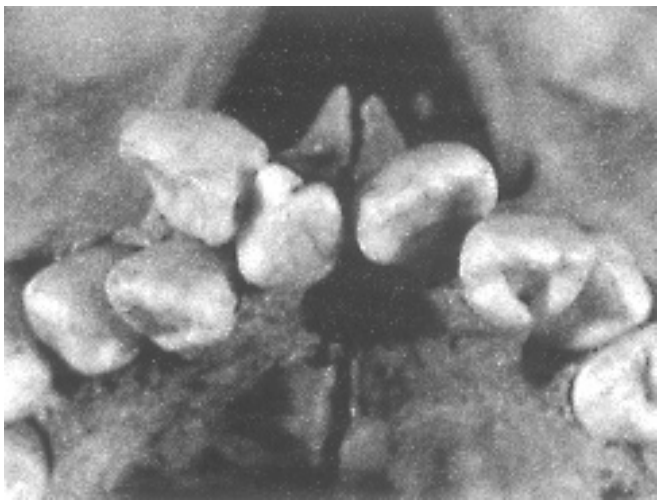

Fig. 4. Native American (Anasazi). Maxillary incisiform supernumerary tooth with labial talon cusp.

CONCLUSIONS

This study presents eight new cases of the rare labial talon cusp and the first estimates of population frequencies. The labial talon cusp is rare and found in less than one percent of the population. Labial talon cusps have been found on all maxillary and mandibular anterior teeth, except mandibular canines. To date, little evidence indicates a direct relationship between the labial talon cusp described here and the more common lingual talon cusp. Possible uses for this trait may be in the research of dental development (Jowharji et al., 1998), dental evolution (Turner, 1998), or genetic syndromes (Tomonori and Ogouchi, 1991). Hopefully future research will enable us to better understand the etiology and genetic basis of this trait, as well as any possible correlation that may relate to other morphological features of the human dentition.

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